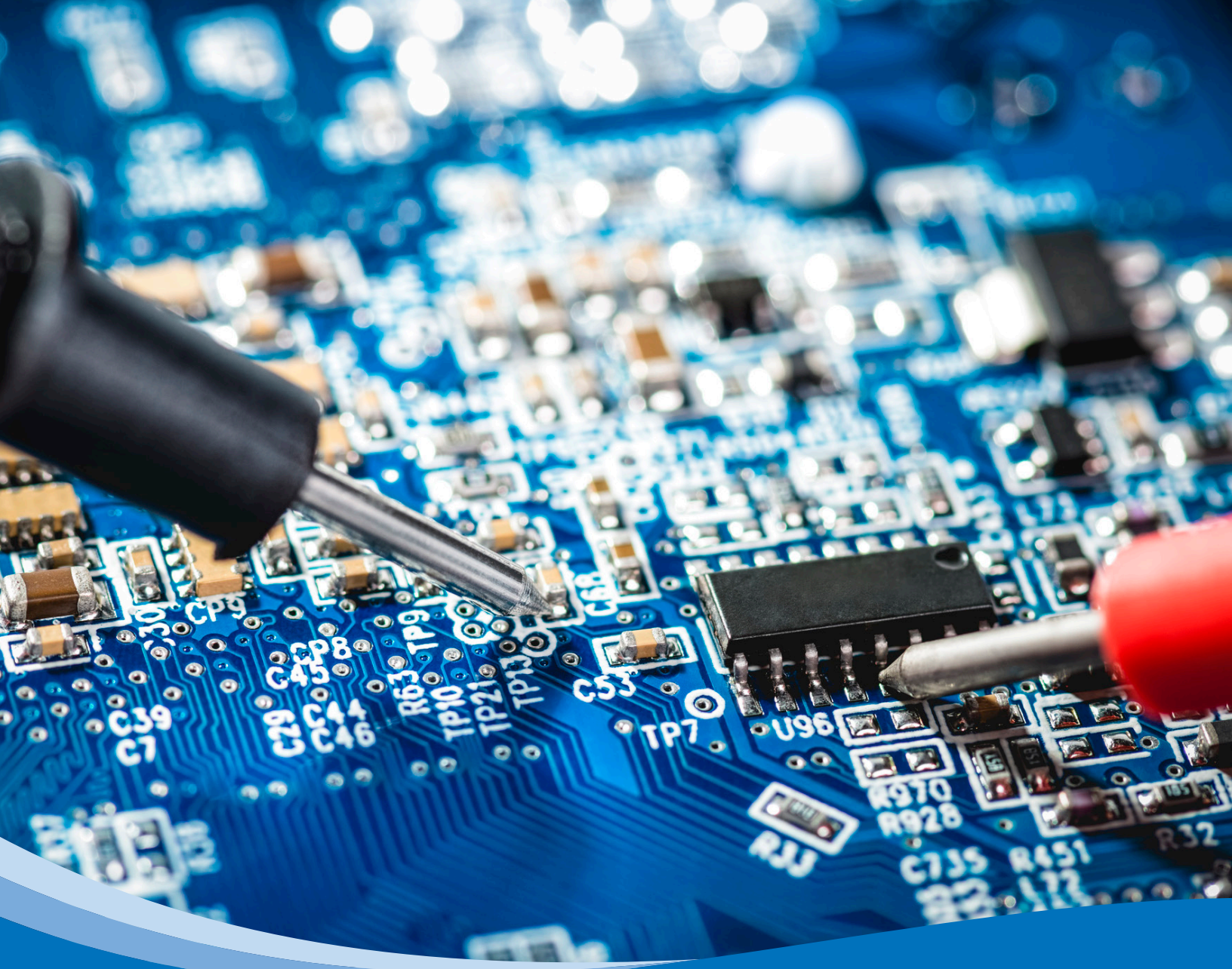


Why humidify?... For Electronics

Ensuring proper humidification in your facility will improve production output, elevate product quality and ultimately, boost ROI

- Control ESD
- Reducing de-soldering occurrences
- Minimizing brittle components

Humidification and Evaporative Cooling

condair

Ensure product quality and production efficiency with proper humidification

Electronic devices, printed circuit boards, components and data are highly sensitive to humidity levels. Insufficient, excessive and inconsistent humidity levels cause damage and defects in electronic components and pose safety concerns due to electrostatic discharge, de-soldering occurrences and brittle components.

Control Electrostatic Discharge (ESD)

Electrostatic discharge (ESD) occurs with the sudden flow of electricity between two electrically charged objects coming into contact with one another. When objects holding different charges come into contact, or when the dielectric between them breaks down, a visible spark can be triggered, which can damage electronics and pose safety concerns for facility operations.

What Causes ESD?

Static Electricity

One of the causes of ESD events is static electricity which is often generated through tribocharging – the separation of electric charges that occurs when two materials are brought into contact and then separated. Insufficient humidity levels increase the risk of occurrences of static electricity.

Electrostatic Induction

Another cause of ESD damage is through electrostatic induction. This occurs when an electrically charged object is placed near a conductive object isolated from ground. The presence of the charged object creates an electrostatic field that causes electrical charges on the surface of the other object to redistribute. The risk of electrostatic induction is increasing with insufficient humidity levels.

Eliminate ESD with Humidity Control

With a humidity level of 40% RH, surface resistance is lowered on floors, carpets, table mats and other susceptible areas. Humidifiers add hydration to the air, which forms a thin protective film on surfaces that serves as a natural conductor to dissipate electric charges. When humidity levels drop below 40% RH, this protection disappears and routine employee activities lead to objects being charged with static electricity, posing a safety risk of serious shock for employees and increasing the possibility of damage or defects within electronic components and devices.

Reduce De-Soldering Occurrences

Proper humidity levels contribute to the effectiveness of wave soldering and surface-mount technology (SMT) processes. Without sufficient humidity, solder paste can dry out resulting in insufficient solder joints and product defects.

What Causes De-Soldering?

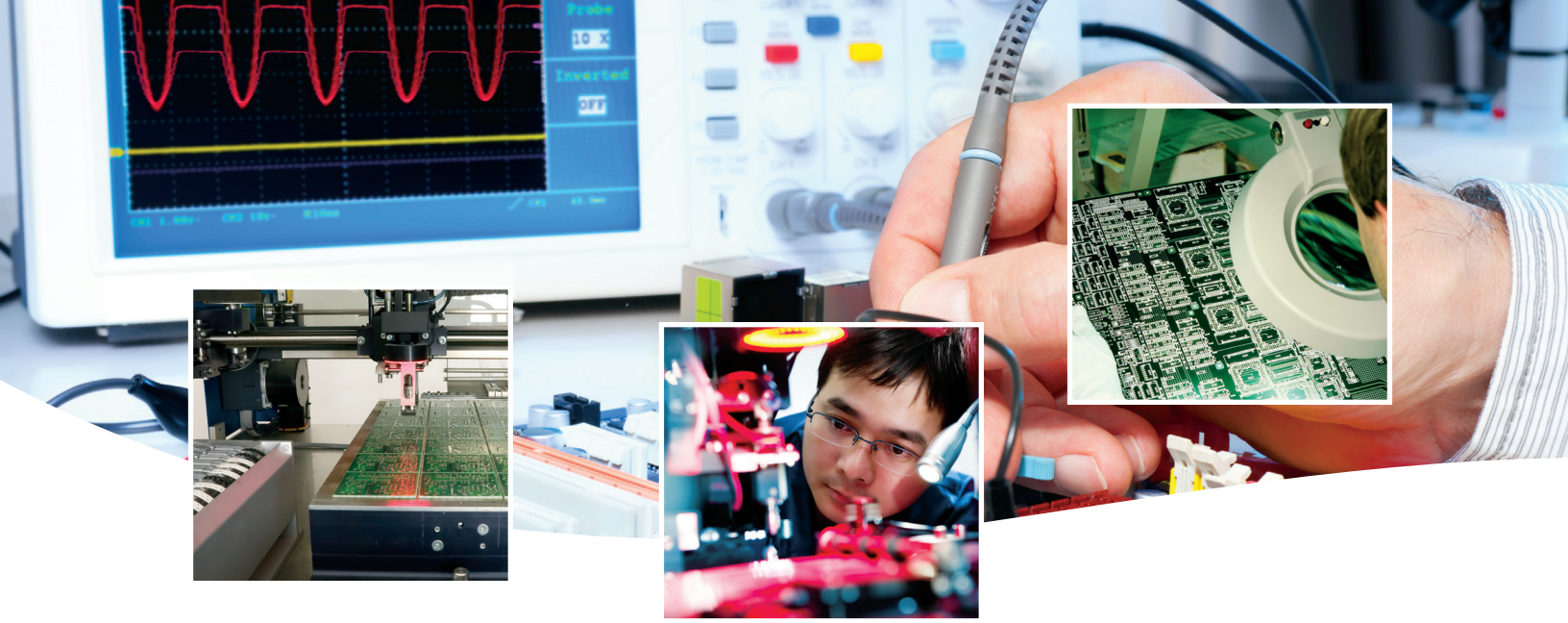
Low Humidity

In low humidity, solder paste solvent evaporates too quickly. This causes the paste to dry out, making the soldering process less effective. Low humidity levels can cause the following problems in electronics manufacturing:

- Processing Time: Low humidity negatively affects abandon time required between prints
- Overall Stencil Life: Low humidity decreases the lifetime of solder paste, impacting productivity and ROI
- Tack Time & Force: Low humidity decreases the amount of time you have to place and situate components in manufacturing and lowers the holding strength of paste after placement, lowering product quality.

High Humidity

In high humidity, solder paste absorbs water, becoming less effective and may begin to slump, posing bridging defects. High humidity levels can also cause damage or defects in moisture-sensitive components in storage and processing.



High humidity levels can cause the following problems in electronics manufacturing:

- Solder Balling: If solder paste absorbs water, it may cause poor coalescence resulting in solder balling defects
- Out-Gassing and Voiding: Excess water absorbed by an electronic system can out-gas during reflow and increase the size and incidence of voiding underneath BGA components
- Defects / Damage to Product: Without proper humidity control, moisture-sensitive components experience a shorter shelf life and may suffer defects and/or damage during processing

Reduce De-Soldering Occurrences with Humidity Control

Ensuring a consistent humidity level of 50% RH in electronics manufacturing and storage facilities will lower the occurrences of damage and defects due to ineffective soldering and de-soldering occurrences.

Minimize Brittle Components

The risk of brittle components in electronic devices and products can cause problems with sub-frame components, poor wiring bonding and internal cracking. These brittle components can cause damage to circuit boards and insulators, shortening shelf life of the product and increasing chances of the device short circuiting.

What Causes Brittle Components in Electronics?

Insufficient humidity can cause the components within electronics to become brittle and varients in humidity throughout your facility can cause damage or defects due to condensation.

Dangers of Moisture and Condensation

When an electronic product or component is transferred from a cooler area of the facility (with lower humidity) to a warmer area of the facility (with higher humidity), the change in humidity can cause condensation to occur within the device or product. When trapped moisture expands or contracts during manufacturing, it can cause delamination of plastic parts from the sub frames, poor wiring bonding and internal cracking. Excessive moisture poses a high risk of damage to circuit boards and insulators, which can lead to defects and short circuits to occur within the device.

Minimize Brittle Components with Humidity Control

Ensuring a consistent humidity level of 50% RH throughout electronics manufacturing and storage facilities is integral to preventing moisture and condensation, which can cause brittle components within a device and lead to short circuiting events. Without effective humidity control, the likelihood of damage and defects in electronic components and devices within manufacturing and storage are drastically increased.

Ensuring proper humidification in your facility will improve production output, elevate product quality and ultimately, boost ROI.

Effective Humidification Solutions for the Electronics Industry

Condair manufactures a comprehensive range of humidifier and evaporative cooling systems across all humidification technologies. Whether for manufacturing or storage facilities, Condair's humidification engineers are able to provide the right solution to meet the needs of every environment.

Effective humidity control poses a long list of benefits for electronics manufacturing and storage:

- Increase production output and productivity
- Boost ROI of facility production and operations
- Maintain and improve product quality
- Decrease waste from damaged components
- Improve indoor air quality for employee health

Condair's Electronic Manufacturing Customers Include:

- **Flextronics Ltd.**
- **Jabil**
- **Hella Inc.**
- **HP**
- **Daktronics Inc.**
- **Itron Inc.**
- **Cascade Microtech Inc.**
- **RIM**

"Our humidification system has lived up to all our expectations. Now, we rarely think about dry air and static electricity. There really aren't issues anymore."

– Paul Anders
Facilities and Operation Manager, Itron Inc.

Nortec EL-Series Electrode steam humidi ication

Nortec LS-Series Pressure steam humidi ication

DR-Series Direct Room humidification

ME-Series Media Evaporative cooling & humidification

As the leading manufacturer of commercial/industrial humidification systems for more than 70 years, Condair has the technology and application expertise to meet the needs of any application.

Contact us today and ensure you have the best humidification solution for your electronics facility.

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